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ODIAB-A

OSCILLOSCOPE, DIGITIZING

1. GENERAL. This procurement requires a hand-held, battery-operated, combination digitizing oscilloscope and digital multimeter.

2. CLASSIFICATION. Type II, Class 3, Style ES, and Color R In accordance with MIL-T-28800. The operating temperature range is limited to 0 to 50 degrees C.

3. OPERATIONAL REQUIREMENTS. The equipment shall be capable of simultaneous display of the input waveform and the selected multimeter function and shall operate within the following minimum accuracies, limits, and specifications.

3.1 Oscilloscope function. The oscilloscope function shall be as detailed below.

3.1.1 Vertical system. Unless otherwise specified, the specifications detailed below apply to two independent vertical inputs. Input common shall be isolated from the equipment chassis.

3.1.1.1 Bandwidth. DC to 50 MHz.

3.1.1.1.1 Sample rate. The maximum sample rate shall not be less than 10 MSa/s.

3.1.1.2 Deflection factor. 1 mV/div to 50 V/div. Accuracy: ±3% of six major graticule divisions.

3.1.1.3 Maximum Input voltage. 300 V (dc + peak ac), 600 V (dc + peak ac) with l0x probe.

3.1.l 4 Vertical modes. Channel 1, channel 2, (individually and simultaneously), channel 1 + channel 2, and
channel 1 x channel 2 (XY). Provision shall be made for inverting channel 2.

3.1.2 Horizontal system.

3.1.2.1 Time base. Range: 1 us/div to 200 ms/div. Accuracy: ±3% of eight major graticule divisions.

3.1.2.2 Triggering. Internal and external triggering shall be provided. Sensitivity: Internal, 0.5 division, from dc to 10 MHz, decreasing to 1.5 divisions at 50 MHz. External: TTL compatible.

3.1.2.3 Parametric measurements. Cursers shall be provided to allow for the measurement of delta volts, delta time, frequency, 1/delta time, maximum, minimum, peak-to-peak, rms, average, phase, rise time, and fall time. Markers shall indicate the part of the waveform used for pk-pk, maximum peak, minimum peak, frequency, rise time, or phase measurements. Time related measurements shall be accurate to ±1.0%. Amplitude measurement accuracy shall be as in 3.2.1.

3.1.3 Display. Usable display area: Eight vertical by eight horizontal divisions with an internal graticule ruled in 0.2-inch, or larger, squares and subdivided in 0.2 division increments along the center axes. If a liquid-crystal display is provided, it shall have backlighting capability. The oscilloscope display area may be reduced during simultaneous display of the input waveform and the multimeter reading.

3.1.4 Waveform storage. The equipment shall be capable of storing not less than eight waveforms with associated vertical and horizontal settings in nonvolatile memory.

3.2 Multimeter functions. The multimeter functions shall be as detailed below. The equipment shall respond to and display the true rms value of ac signals.

3.2.1 Voltage measurement. Range: 500 mV to 600V full scale. Maximum resolution: 0.l mV. Accuracy: dc: ±(0.5% of reading + 5 digits), ac: ±(2% of reading + 15 digits) from 50 Hz to 20 kHz and 0 to 600 Vrms. The meter shall be capable of displaying the measured value in terms of dBV, or dBm referenced to 50, 75, 93, 135, 300, 000, and 1000 ohms.

3.2.1.1 Noise rejection. DC: common mode: >100 dB at dc, 50, 60, and 400 Hz. AC: common mode: >60 dB at dc to 60 Hz.

3.2.1.2 Crest factor. 3.0 minimum.

3.2.2 Resistance measurement. Range: 0 to 20 megohms full scale. Maximum resolution: 0.l ohm. Accuracy: ±(l.0% of reading + 5 digits). Overload protection: 500 Vrms.

3.2.3 Frequency measurement. Range: 1.0 Hz to 200 kHz. Minimum pulse width 2 us. Maximum resolution: 0.01 Hz. Accuracy: ±(0.5% of reading + 2 digits).

3.2.4 Resolution and display. A 3-1/2 digit backlit display shall be provided.

3.2.5 Memory. The equipment shall be capable of capturing and holding a reading for display and of storing and displaying the minimum, maximum, and average of all readings taken over an indefinite period of time. The equipment shall give an audible indication when a new minimum or maximum value has been recorded. In addition, the equipment shall be capable of displaying the difference between a reading stored in memory and any subsequent readings.

3.2.6 Indicators. The required indicators are input overload and polarity.

3.3 Automatic setup. The equipment shall have a single push-button control that will initiate automatic adjustment of the vertical and horizontal deflection factors and trigger level, or multimeter mode, as appropriate, for an optimized display of the input signal. This function shall operate with signals exceeding 1% duty cycle and frequencies of 60 Hz.

3.4 Input connectors. Input connectors shall be banana jacks spaced 19 mm (0.75 in) apart for use with dual-banana connectors, and BNC female.

3.5 Input impedance. 1 megohm, nominal.

4. GENERAL REQUIREMENTS.

4.1 Power source. MIL-T-28800 dc internal power source requirements are invoked. Internal batteries and a charger are required. Minimum operating time shall be 4 hours following a maximum recharge time of 16 hours. The charger shall operate from the nominal ac power source.

4.2 Weight. 3 kg (6.6 lb) maximum.

4.3 Dimensions. 65 mm (2.5 in) high, 140 mm (5.6 in) wide, and 275 mm (10.8 in) deep, maximum.

4.4 Lithium batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A

request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.5 Accessories. The equipment shall be provided with safety-designed test leads in accordance with MIL-T-28800, two 1:1 and two 10:1 oscilloscope probes. A shock-absorbing protective holster with a flexible stand device shall also be provided.